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Results of Kindergarten Roundup Screening: Rural Versus Suburban Children

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RESULTS OF KINDERGARTEN ROUNDUP SCREENING: RURAL VERSUS SUBURBAN CHILDREN

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THESIS ACCEPTANCE

Accepted for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree Master of Arts, University of Nebraska at Omaha.

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Chapter 1

INTRODUCTION

Language is the vehicle for learning and the child who does not possess adequate language skills is handicapped in all areas of school instruction. Additionally, society evaluates child and adult in the academic setting, socially, and on the job by their ability to manipulate the English language.

The school's accelerating expectations of entering kindergarteners has put additional pressures on the majority of children. The research in developmental linguistics has shown that a certain level of maturity must be reached before tasks can be learned. The problem for the entering kindergartener whose language development is depressed is compounded.

The Educational Service Unit #3 (ESU 3), for the past seven years (1972-1978), has conducted special pre-kindergarten developmental screening testing opportunities called "Kindergarten Roundups" in the four-county area it serves. These counties include Douglas, Washington, Sarpy and Cass, all located in the area of eastern Nebraska surrounding Omaha. Special programs for children deficient in speech or language are offered to the schools in this four-county area on a contract basis through ESU 3.

Two distinct populations are served by ESU 3 at these kindergarten roundups and for speech and language therapy, that is, a rural population and a suburban population. For the purpose of this study

rural children are defined as children who reside on a farm and attend one or two room K-6 or K-8 schools. These schools are individually governed by school boards comprised of individuals from the immediate geographic area each school serves. Suburban children are defined as children residing in small satellite communities in the greater Omaha metropolitan area and attend large public schools within the community of residence. The school boards of these communities also are comprised of members of the immediate community. The economic structure of the suburban communities is dependent upon industry and businesses within the community, and also is influenced to a great extent by a segment of the population commuting to Omaha for a multitude of varying occupations. In contrast, the rural area's economy almost totally depends upon farm related occupations.

Identical kindergarten roundups are performed annually for both the rural and suburban populations. A typical roundup includes screening of hearing, vision, gross and fine motor development, and speech and language development. The physical concerns, i.e., vision, hearing and motor development are quite readily identified at kindergarten roundup. More difficult to evaluate are social-emotional development and general language development. The general assessment made of physical development makes remediation or a start of remediation in these areas possible before the child enters school. Problems which may affect academic progress such as poor language development or emotional development can be brought to the attention of the parents and the school. Further in-depth testing and possible remediation programs can then be planned.

The rural population is sometimes hampered by limited services available in planning a program for a child in need of a special program. However, many of these one or two room schools do have access to specialists in all areas, but do not elect to take advantage of these services. Diversity in planning programs for children in both rural and suburban schools is greatly needed but not always accomplished by servicing agencies.

Due to the fact that a large number of children are evaluated at kindergarten roundups much cross-sectional data can be gathered. For example, information concerning performance in overall language achievement, specific language concepts, age, sex and environmental influences can be obtained.

STATEMENT OF THE PROBLEM

The purpose of this study was to explore whether or not there was a difference in the pre-kindergarten language performance of children from rural (Group I) and suburban (Group II) populations. The data, collected over a five-year period (1973-1977), involved two groups of children: 214 rural (Group I) and 214 suburban (Group II). The parameters measured included: language age in months, auditory comprehension age in months, verbal ability age in months, overall language quotients, auditory comprehension quotients, verbal ability quotients and ability to achieve basal performance assessed by the Zimmerman Preschool Language Scale (Zimmerman, Steiner and Evatt, 1969). Measures of central tendency were computed for each variable. These measures are discussed in relation to differences in performance between the rural

and suburban groups.

Research Questions

The following research questions were posed in regard to the data collected:

1. Do rural pre-kindergarten children, as defined in this study, obtain lower scores on the Zimmerman Preschool Language Scale than their suburban couterparts?

2. Do fewer rural pre-kindergarten children attain a four year basal score than pre-kindergarten suburban children?

Hypotheses

The following hypotheses were posed in regard to the data collected:

1. Four to five year old children from rural schools will score significantly lower (.05 level) than four to five year old children from suburban schools on the basis of their language performance as assessed by the components of the Zimmerman Preschool Language Scale.

2. Four to five year old children from rural schools will score significantly lower (.05 level) than four to five year old children from suburban schools in attaining a four year basal score on the Zimmerman Preschool Language Scale.

Importance of the Study

Research involving such a large number of subjects is usually considered reliable. The results of this study may yield valuable information regarding age and demographic background influences. A need

for diversity in program planning may be discovered.

Method of Study

This study is descriptive and comparative in nature. Descriptive and inferential statistics have been computed and discussed.

Limitations of the Study

In order to use a large number of children, the data collected covers a five year span.

Generalizations concerning these data must be guarded due to the fact that the background of these children, other than their residence, is unknown. The area of the sample is limited to four eastern Nebraska counties with divergent socioeconomic status.

Chapter 2

REVIEW OF THE LITERATURE

The review of the literature which follows is divided in three sections: 1) receptive language, 2) expressive language, and 3) environmental and socioeconomic influences on language attainment.

RECEPTIVE LANGUAGE

It is difficult to infer a child's linguistic competence from his performance in language. Testing a child's comprehension of language perhaps comes closer to a goal of testing knowledge of language or linguistic competence (Fraser, Brown, Bellugi, 1963).

Linguists are becoming much more aware of the area of receptive language as a guideline to determining language development. Few studies have been conducted in this area and all investigations involve responding to a spoken stimulus by making a nonverbal motor response.

The Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965) is probably the most widely used test to determine receptive language abilities. This test provides an estimate of the subject's verbal intelligence through measuring his vocabulary. This test only measures a one-word uttered response by the subject indicating to a picture of the best representation of the word. The number of correct responses may be converted to mental age, I.Q. standard score and percentile equivalent.

The reliability of the test has been established in several studies. Test-retest reliability coefficients for both forms are high

(.97), indicating good consistency of the results. Performance on the Peabody Picture Vocabulary Test correlate with performance on the Stanford-Binet (.71) and with WISC full scale I.Q. (.61) (Dunn, 1965).

The Ammons Full Range Picture Vocabulary Test (APVT) (Ammons and Ammons, 1958) is similar in format to the Peabody Picture Vocabulary Test. This test measures general intelligence as well as vocabulary comprehension. The APVT contains four pictures which are shown to the child. As the examiner says a word, the child indicates which of the pictures best represents the given word. The APVT is not as well standardized as the PPVT, nor are the cartoon like drawings in this test particularly clear. Norms for this test begin at two years of age.

Standardized picture vocabulary tests tend to assess the comprehension of a rather limited category of words. Word categories such as prepositions are generally not tested. The Preschool Preposition Test (Aaronson and Schaefer, 1971) may be used to identify problems in comprehension of prepositions such as up, into, inside and under, in preschool and early grade children. The test contains twenty-three items. Normally developing children show increasing ability to comprehend the test items as a function of age with a ceiling effect occuring at ages five and one-half or six. Performances on the test correlate positively with scores on the Stanford-Binet and Peabody Picture Vocabulary Test (.57).

Being able to process an increasing number of syntactic units is an indication of gaining linguistic maturity. A tool used widely to assess increasingly more difficult language comprehension is the Assessment of Children's Language Comprehension (ACLC) (Foster, Giddan,

Stark, 1972). The syntactic units are referred to as critical elements. Each additional word which the subject processes is a critical element added to his linguistic maturity. The ACLC is divided into four sections. The first part tests only one critical element, the second part tests two critical elements, and so on.

Fraser, Bellugi and Brown (1963) conducted a study of children's language development using the ACLC as a part of their study. In testing 12 children (six boys and six girls) between the ages of 37 and 73 months, they found that a general progression in the level of performance developed with increasing age and that sex differences were not statistically significant.

Another test which evaluates oral language comprehension without requiring expressive language from the subject is the Test for Auditory Comprehension of Language (TACL) (Carrow, 1973). The purposes of this test are two-fold. It measures the auditory comprehension of language structure and assigns the subject to a developmental level of comprehension based on performance. The second function is diagnostic. The test items are arranged by linguistic form class on the back of the record form. Difficulty with certain groups of items indicates a weakness in a particular area of linguistic skill. Normative data are available for the range from three years to six years eleven months. Concurrent validity has been established with several clinical groups, ranging from deaf children to children with clinical language disorders. Test-retest reliability has been established with correlation coefficients ranging from .77 to .94.

A study conducted by the Educational Testing Service (Shipman,

1972) evaluated the expressive and receptive language of culturally deprived children. To test receptive language a combination of the Peabody Picture Vocabulary Test and the ETS Matched Pictures Language Comprehension Task and the ETS Story Sequence (Shipman, 1972) was used. The ETS Matched Picture Task consisted of the child selecting the correct picture from a set of paired cards containing similar elements, but depicting different relationships between elements when a word was read to him. The Story Sequence Task involved arranging a set of pictures as a story was read to the child.

The expressive language of the child was tested using an adaptation of the PPVT and the EST Story Sequence Task. The PPVT was adapted for expressive language by having the child name one of four pictures pointed to. The Story Sequence Task required the child to choose some pictures from several exhibited and tell a story about those chosen.

Relationships between the test scores were then computed using Pearson's coefficient of correlation (r). Correlations between the expressive and receptive language tests were all below .35 except between the two forms of the PPVT, which had a correlation of .69. This study suggests that expressive and receptive language are independent skills which should be assessed separately.

The use of normative data to produce a language scale has gained increasing acceptance in the last few years. The Zimmerman Preschool Language Scale (Zimmerman, Evatt, Steiner, 1969) separates the auditory and verbal aspects of developing language skills. The scale is based upon maturational and developmental aspects of language competence which

have been reported by authorities in the fields of normal human development and psycholinguistics.

In a study reported in 1956, (D'Asaro, Lehrohoff, Zimmerman, and Jones) a language scale was presented to a group of cerebral palsied infants and children, aged one month to six years. The scale attempted a gross differentiation of receptive, expressive and phonetic skills. The observations of this study indicated a need for a diagnostic instrument to evaluate developmental progress, maturational lag, strengths and deficiencies in the language skills of young children. The Zimmerman Preschool Language Scale was devised as an outgrowth of this study. Unlike other scales which assess language status, this scale uses the natural dichotomy between auditory comprehension and verbal ability. This allows an assessment of deficiencies which might otherwise be masked or overemphasized by such handicaps as shyness, limited or defective speech, or such pathological problems as aphasia or cerebral palsy.

The scale consists of a series of auditory and verbal tasks, each of which has been given an age placement on the basis of empirical evidence of the average age of attainment by preschool and early primary children. Scoring produces an auditory comprehension score and a verbal ability score that can be converted into either a language quotient for each area, or to an overall language age score.

The literature reviewed thus far has shown that there are relatively few receptive language tests to assess pre-kindergarten children. Few studies have been conducted in this area and all investigations involve responding to a spoken stimulus by making a nonverbal motor response. More studies have been done in expressive language assessment

and some of these will be discussed in the next section.

EXPRESSIVE LANGUAGE

At its most basic level, language is defined as a system of verbal symbols (words) that people use to communicate with one another (Carroll, 1964). The ability to create and use language is one of the most distinctive features of human beings. Without language the transmission of shared meanings, values and traditions would be virtually impossible.

The term speech is meant to describe the oral or spoken utterances of human beings to convey meaning, while the term language is used to describe the general knowledge a person possesses of the linguistic concepts upon which all speech is based (Bartel, 1975). If an internal language system has not been developed, meaningful speech is impossible.

It is possible to infer the degree to which a child possesses inner language on the basis of how the language symbols actually are received or expressed. Myklebust (1964) has stated that children master five developmental levels that lead to language proficiency. The first level in this model involves the acquisition of an internal language system or inner language. The second level entails making associations between auditory symbols and experience, which results in comprehension of spoken words (auditory receptive language). At the third level auditory expressive language is demonstrated through the use of speech. In the final stages the development of reading (visual receptive language) is followed by expressing printed words through writing (visual expressive language). The distinction between receptive and expressive

language is of great importance when attempting to assess a child's abilities in expressive language.

Major components or elements of language usage include (1) phonology, (2) morphology, (3) syntax and (4) semantics (Berry, 1969). It is the combination of these four elements that adds a distinctive structure and meaning to language.

Phonology is the study of the sound system that constitutes spoken language. Phonemes refer to the specific sounds that make up a language. Phonemes, produced correctly and alone, have no meaning, but must be produced correctly to conform to standards of accepted usage within a language. For example /k/ and /g/ are meaningless by themselves, but if they are interchanged in a word they alter its meaning (Kate-gate). If a child does not perceive differences in phonemes and produces them in a distorted fashion, language usage and a listener's understanding may be impaired.

Two commonly used tests of a child's competence in phonology or sound articulation are the Templin-Darley Tests of Articulation (Templin and Darley, 1960) and the Goldman-Fristoe Test of Articulation (Goldman and Fristoe, 1969).

The Templin-Darley Tests of Articulation are diagnostic in nature; however, a designated 50 items may be used for screening purposes. The specific test items tap the child's ability to produce vowels, diphthongs, single consonants and consonant blends in varying combinations. In this test the child is required to say a series of single words that contain a test sound or a combination of sounds in a specific position. When these are not articulated properly, the child

is given a correct pronunciation of the word and asked to repeat it. By using this measure the examiner also can evaluate the degree of intelligibility of a child's conversation. Age norms have been established for this set of tests, which helps determine whether or not the child's ability is above or below average in comparison to peers.

The Goldman-Fristoe Test of Articulation (GFTA) is a test intended to evaluate the child's ability to produce consonant sounds. This test makes use of three assessment subtests. The first subtest, sounds-in-words, consists of 35 familiar pictures that the child is asked to identify and respond to questions about some of them. The second subtest, sounds-in-sentences, provides a systematic means of assessing sound production in a context similar to that found in conversation. Two narrative stories are read aloud by the examiner and illustrated by sets of five and four pictures, respectively. The child is asked to recount each story in his or her own words, using the pictures as memory aids. The stimulability subtest, the third subtest, determines if phonemes that were articulated incorrectly are now articulated correctly when the child is given maximum stimulation. Norms are provided for children from three to eight years of age.

Morphology is the study of the smallest meaningful units of language (morphemes), which cannot be divided into smaller units without destroying their meaning. The word bird, for example, contains only one morpheme. It is impossible to divide this word into smaller components and yet maintain the basic meaning. The analysis of morphemic elements includes the study of grammatical markers used in language to specify concepts such as plurality, verb tense and shifts from adjectives

to adverbs. Irregular morphemes such as the plural of mouse becoming mice must also be analyzed.

Syntax relates to the arrangement of words into meaningful phrases and sentences. It is apparent that children must learn the importance of proper ordering of words within a sentence to facilitate adequate receptive and expressive language. Syntax undoubtedly plays a vital role in production and understanding of language. Oral language development will be disorganized and difficult to understand if the use of syntactical rules is not learned.

Morphology and syntax, when combined, are often times referred to as linguistic structure. Tests often used to evaluate linguistic structure are the Carrow Elicited Language Inventory, the Developmental Sentence Analysis and the Northwestern Syntax Screening Test.

The Carrow Elicited Language Inventory (Carrow, 1974) is a test to evaluate a child's control of grammar. It consists of 51 sentences and one phrase. The examiner reads a series of sentences to a child and asks the child to imitate exactly what he hears. Taping of the test is necessary. The average length in words of the sentences and phrases is six words. Of the 51 sentences, 47 are in the active voice and four are in the passive voice; 37 are declarative and 12 are interrogative, and two are imperative. In addition to a total error score, subscores are obtained for each grammatical category. Adequate reliability and validity statistics are reported in the manual.

The Developmental Sentence Analysis (DSA) (Lee, 1974) is perhaps the most comprehensive test of assessing syntactical structure. The procedure for administration of the DSA is to elicit spontaneous

speech from the child while the child is in conversation with an adult. The DSA consists of two separate procedures, Developmental Sentence Types (DST) and Developmental Sentence Scoring (DSS). The DST is used to classify presentence phrases (when either a subject or predicate is missing) and to indicate if grammatical structure is developing in an orderly manner before basic sentences emerge. A group of 100 phrases must be collected with the DST procedure. The DSS is the analysis of grammatical structures found in complete sentences. A group of 50 complete sentences is needed for analysis with the DSS technique. A sentence is complete if it has a noun and a verb in a subject-predicate relationship. The speech sample must be a group of consecutive phrases and no repeated sentences are permitted in the final scoring. The statistical data provided includes (1) a cross-sectional study of DSS language samples from 200 children between the ages of 2.0 to 6.11, which was used to establish a normative base for this instrument; (2) estimates of internal consistency; and (3) item analysis of the DSS procedure. Information is also provided regarding the differences in development of syntax between the sexes.

The Northwestern Syntax Screening Test (NSST) (Lee, 1969) provides a quick estimate of a child's level of syntactical comprehension and use. The age norms provided are from 3 years 11 months to 7 years 11 months. A total of 40 items are used to test syntactical ability: 20 items assess the child's receptive ability by requiring the child to look at four pictures and indicate the one that is appropriate after the examiner reads a sentence; and 20 items assess the child's expressive ability by having the child repeat sentences originally spoken by the

examiner as the examiner points to pictures. The norms are based on 344 children from middle-class families in which standard English is spoken.

Semantics refers to the meaning of words and sentences. Semantics has received less attention than other components of language. Initially a child develops associations between words and common objects in the environment. However, demands for increased language usage are imposed on the child and he must rely on the situational and linguistic concept in which words are used. Clark (1974) has demonstrated ways in which children comprehend words is partically a function of the total context in which they hear words. Competency in using each component of language comes from deriving the most meaning from a given phrase or sentence.

Tests which ascertain semantics mainly focus upon comprehension and use of words, or tests of vocabulary. Frequently used measures of semantics include the Peabody Picture Vocabulary Test and Ammons Full-Range Picture Vocabulary Test which are discussed in the receptive section of this review.

The reasons for not developing verbal ability or expressive language are varied. Most obvious are inadequate intelligence, impaired hearing and environmental deprivation. This leads to the third area of the review of the literature in this study.

ENVIRONMENTAL AND SOCIOECONOMIC INFLUENCES

The quality and quantity of contact that children have with adults and peers is a significant variable in their language development

(Cazden, 1966). McConnell and Robertson (1970) have determined that preschool disadvantaged children use less verbal communication than their advantaged peers. Communication in geographic or socioeconomic deprived children tends to be restricted and characterized by parental language intended mainly to control the children's behavior and to express emotions. In addition, language in these environments is seldom used to explain or inform.

As part of an ongoing program to study the development of children in interaction with their environment, Shipman (1978) interviewed the families of 1,212 nine-year-old children from urban and rural low income families. She later compared the family variables to academic achievement. The results indicated that the rural children are more disadvantaged academically than the urban group.

Television can be benefical to the environmentally or geographically deprived child as shown in a study conducted for the Educational Testing Service by Ball (1970). The skills presented on the television series, Sesame Street, were evaluated after its 1970 season. Research results showed that Sesame Street benefitted children from low-income inner-city areas and isolated rural areas more than children from middle-class suburbs. Three-year-old children gained the most from watching the program.

The possible gains a preschool child can attain by attending a preschool have been studied in depth. Hubbard (1967) reported the findings on oral language development of head start graduates. Thirty head start graduates and 60 non head start graduates in the first and second grades in Austin, Texas were evaluated. The evaluation consisted of

measuring reading achievement through oral language development. A 15 item device of testing was devised by reading supervisors and reading teachers who also adminstered the test. The group of instructors headed by Dr. Hubbard reasoned that development of oral language precedes both introduction to reading and development of any reading facility. In summary, Dr. Hubbard reported that oral language development is more homogeneous in its distribution in mean item scores between the two groups. The head start group showed a greater willingness to participate in oral exchange and better expressive language skills.

In another study conducted by Clyde Reese and Jack Stout (1974) the development of preschoolers attending structured day care centers was studied. The children numbered 421 and were from socioeconomically mixed child development centers. Twelve socioeconomically mixed and six unmixed preschool centers in rural, urban and inner-city areas were used for study. The instruments used in evaluation were: The Kansas Social Interaction Observation Procedure, the Peabody Picture Vocabulary Test, The Test of Basic Experience, the Test of General Abilities and the Cincinnati Autonomy Test Battery. In general, it was concluded that socioeconomic mixing in preschool programs does enhance chances of achieving certain kinds of educational objectives and even seems to act as a catalyst for augmenting or altering the effects of other predictor variables. The practical implications of these findings are that socioeconomic mixing has a positive effect on the cognitive development of disadvantaged children and that advantaged subjects realize positive gains on both the cognitive and social dimensions.

Kirk and Bereiter (1969) studied the performance of suburban

and rural preschool children on test of sound pattern and speech sound auditory discrimination. The groups consisted of 15 rural and 15 suburban children from random preschools in the Urbana, Illinois area. The Preschool Auditory Discrimination Test was used as it evaluates a sound pattern field as well as speech sounds. The results showed suburban children did better on discrimination of speech sounds than non-speech sounds and the reverse was true of the rural group. Remedial efforts were undertaken dealing directly with language rather than generalized speech or discrimination training. Follow-up testing showed much gain in the language oriented program to improve discrimination of speech sounds. The authors feel this is in direct correlation with reading achievement attained by disadvantaged children.

Children with language deficits who are admitted to first grade without having acquired discrimination skills show limited ability to identify phonetic sounds for reading (Wiig, Semel, 1976). They may have problems in same-different discrimination of sounds, in analyzing and synthesizing phonemes and phoneme sequences, in segmenting words into smaller grammatical units and in forming stable sound-symbol associations. These deficits may result in limited or slow academic achievement in spelling and reading.

Nurss and Day (1970) conducted a study examining several aspects of language development in preschool age children. Base line data was collected on 147 higher status children and 147 lower status children, all four years of age. The items measured were 1) proficiency in certain aspects of standard American English, 2) use of attributes in description and 3) ability to imitate, comprehend and produce

selected grammatical structures. The children were pre and posttested on the Day Language Screen and the Brown, Fraser, Bellugi Test of Grammatical Contrasts. Data were also collected concerning the language programs used in each of the preschools the children attended and the demography of the children. The results indicated there were status differences in the development of language skills in four year olds. The higher status group scored significantly higher in all three categories on the pre and posttests. However, the lower status groups had significantly greater gain scores, indicating that the language program used in their classes improved their language maturity. This may suggest the need for direct instruction in language skills for lower status preschool children or demographically isolated children.

It is apparent that environmental and socioeconomic influences have an impact on developmental readiness for school of pre-kindergarten children. Rural children use less verbal communication than their suburban peers. Rural children have less of an opportunity to experience preschool and cultural growth activities where cognitive and social growths are attained.

Chapter 3

TESTING PROCEDURES AND ANALYSIS OF DATA

SUBJECTS

The subjects for this study were 214 rural and 214 suburban preschool children residing in four eastern counties in Nebraska (Douglas, Sarpy, Washington and Cass). All of the subjects participated in the annual kindergarten roundup of children who would be eligible to enter school the next fall. The testing took place in the months of March, April and May preceeding the start of school the next fall, and covered the five academic years from 1973-1977. All subjects were four or five years of age.

Subjects for the rural group sample included all available subjects in the five year period, 1973-1977. All rural subjects resided on a farm and would be attending a rural K-6 or K-8 school. Subjects for the suburban group were randomly sampled from the same five year period. All suburban subjects resided within the community of the school they would be attending and not on a farm.

THE TEST BATTERY

Identical test batteries were performed on each subject. The areas of vision, hearing, gross motor (large muscle) development, fine motor (small muscle) development, articulation and language were all screened. The purpose of the roundup is to identify children with problems which might affect their achievement in school. The items of

importance to this study are articulation and language, assessed by the Zimmerman Preschool Language Scale. All of the examiners of the Zimmerman testing were speech and language clinicians employed by the Educational Service Unit #3.

The articulation section was graded on a pass-fail basis at age level norms for five, six and seven years of age. The articulation testing is imitative in nature. Individual phonemes in all positions of words are repeated by the subject after the examiner first says them for the five and six year old levels. The procedure for the word imitating test is as follows: the child's attention must be focused on the examiner; a practice word is given and if the child understands the directions of "say baby," the entire group of individual words is given. If the child does not understand the directions, more trials are given before administration of this section. The words are scored pass-fail on the child's first response and words are never repeated by the examiner. The rationale for this method of evaluating individual phonemes by imitation is that it removes the variable of picture recognition and vocabulary knowledge measured elsewhere in the Zimmerman Preschool Language Scale.

The seven year old level of sentence articulation involved the child imitating each word of a short sentence correctly. The procedure for the sentence imitation test is as follows: the examiner asks the child to repeat the trial sentence, "Ice cream and cake are on the table"; if the child understands the directions the test sentences are given. If the child does not understand the directions, further trials are given. Again, the sentence is scored on a pass-fail basis depending

on correct articulation of each word of the sentence. One repetition of each sentence is given if the child requests it but no omission of words is accepted. However, if a word is added, or if the order of words is not exact but each one present and all articulation is correct a passing score is given.

The language sections of the Zimmerman Preschool Language Scale yield an auditory comprehension score, a verbal ability score and an overall language age score. All three are measured using an age in months score and compared to the child's chronological age in months. The auditory comprehension sections require no verbal response from the child, whereas the verbal ability sections do require verbal responses. A ten month age difference between these two sections is considered significant.

Although the instrument evaluates children from one year, six months to seven years of age, the basal age of four years was used for the kindergarten roundup screening. Testing for all subjects was started at the four year auditory comprehension level (four items), and proceeded to the four year verbal ability section (four items). If any of the eight items at the four year level was missed, the subject was taken back to the three and one-half year level. If basal was not attained at that level, the child was taken back to the three year old level and so on until a basal age was established. All subjects were given the entire test upwards to the seven year old level. For the purpose of this study a pass-fail score was given at the four year old level for attainment of basal. The age in months scores of each subject in this study reflects where he attained basal, however.

PROCEDURES

As was mentioned before, the sections relative to this study were administered by qualified speech and language clinicians. All personnel were instructed in how to administer and score the instrument at inservice meetings. Results are assumed to be reliably consistent due to this prior procedural and scoring training.

The climate of the kindergarten roundup screening varied somewhat from one school to another. Testing was administered in gymnasiums, multi-purpose rooms and classrooms with at least ten feet between individual stations to provide the least possible distraction to the child. For this study any indication on the scoring device that the examiner had made indicating invalid results voided use of that subject's data.

RESEARCH HYPOTHESES

The following null hypotheses will be tested:

1. Four to five year old children from rural schools versus suburban community schools will not be significantly differentiated (.05 level) on the basis of their speech and language performance as assessed by the following components of the Zimmerman Preschool Language Scale.

1.0 Language Quotient
 1.1.0 Auditory Quotient
  1.1.1 Color recognition
  1.1.2 Distinquishing prepositions
  1.1.3 Tactile comprehension

1.1.4 Concept acquisition (use of)
1.1.5 Differentiation of self
1.1.6 Quantitative comprehension
1.1.7 Right-left directional orientation
1.1.8 Attentive auditory imitation (nonverbal)
1.1.9 Conservation of size
1.1.10 Self concept (body parts)
1.1.11 Classification concept
1.1.12 Abstract computation
1.1.13 Auditory acuity for memory
1.2.0 Verbal Quotient
1.2.1 Meaningful imitation
1.2.2 Transductive thinking (opposites)
1.2.3 Differentiation of concrete experience
1.2.4 Numerical unit seriation
1.2.5 Attentive verbal imitation (short term auditory memory)
1.2.6 Analysis of experience
1.2.7 Labeling ability
1.2.8 Class integration availability
1.2.9 Consonant articulation
1.2.10 Temporal ordering differences
1.2.11 Sentence building
1.2.12 Self concept
1.2.13 Sentence articulation (nine syllables)

2. There will be no significant difference (.05 level) between rural and suburban children on the variable of four year old basal attainment on the Zimmerman Preschool Language Scale.

DATA ANALYSIS

All data was keypunched and computer analyzed at the Omaha computing facility of the University of Nebraska at Omaha on the IBM 370 computer. The subprograms of the Statistical Package For The Social Sciences, (S.P.S.S.), (Nie, et al., 1970), version 7.0, were employed for all data analysis performed. The following is a summary of the subprograms of the S.P.S.S. used in this study.

1) Subprogram Frequencies yielded descriptive statistics related to the frequency distribution of each variable, for each of the

subgroups in this study. Measures obtained included mean, standard deviation, range, minimum and maximum. Histograms for selected distributions were obtained as were percentage of pass and fail response on the dichotomous variables.

2) Subprogram t-Test was employed to obtain statistical comparison of mean differences on each of the variables in the study as defined in the hypotheses.

3) Subprogram Discriminant was employed to obtain single multivariate statistics, testing whether or not subsets of dependent variables existed which significantly discriminated between the rural and suburban subjects (.05 level). Two separate analyses were carried out; one on the pooled composite scores, and one on the pooled auditory and verbal items.

Chapter 4

RESULTS

The following data were gathered during pre-kindergarten screenings of 214 rural and 214 suburban children. Several tests were administered to each child during the screenings, but only one, the Zimmerman Preschool Language Scale, was relevant to this study.

Descriptive Statistics

Subprogram Frequencies (S.P.S.S., Nie, et al., 1975), yielding descriptive statistics relating to the frequency distribution of each relevant variable, was computed for both groups. Measures obtained included mean, standard deviation, range, minimum, maximum and percentage of pass and fail responses on the dichotomous variables.

Table I compares chronological age for both groups. The rural group had a mean age of 60.9 months and the suburban group, 60.2 months.

Figure 1 represents percentage of basal attainment of items at the four year level in histogram form. All of the subjects were four years of age or older. The rural group of children attained basal at a rate of 62.1%, and the suburban group 70.1%.

Table II compares mean scores for both groups on composite scores of auditory age in months, verbal age in months and overall language age in months. The rural group's mean score for auditory age of 64.7 months was 2.8 months lower than the suburban group's. Comparing verbal age, the rural group's mean score of 63.9 months was 5.4 months

Table I

Descriptive Statistics Comparing Chronological Age for Both Groups

Variable	N	Mean	S.D.	Min.	Max.	Range
Rural (Group 1)	214	60.89	4.29	51	78	27
Suburban (Group 2)	214	60.20	3.70	52	72	20

Figure 1. Histogram Depicting Basal Attainment for Both Groups

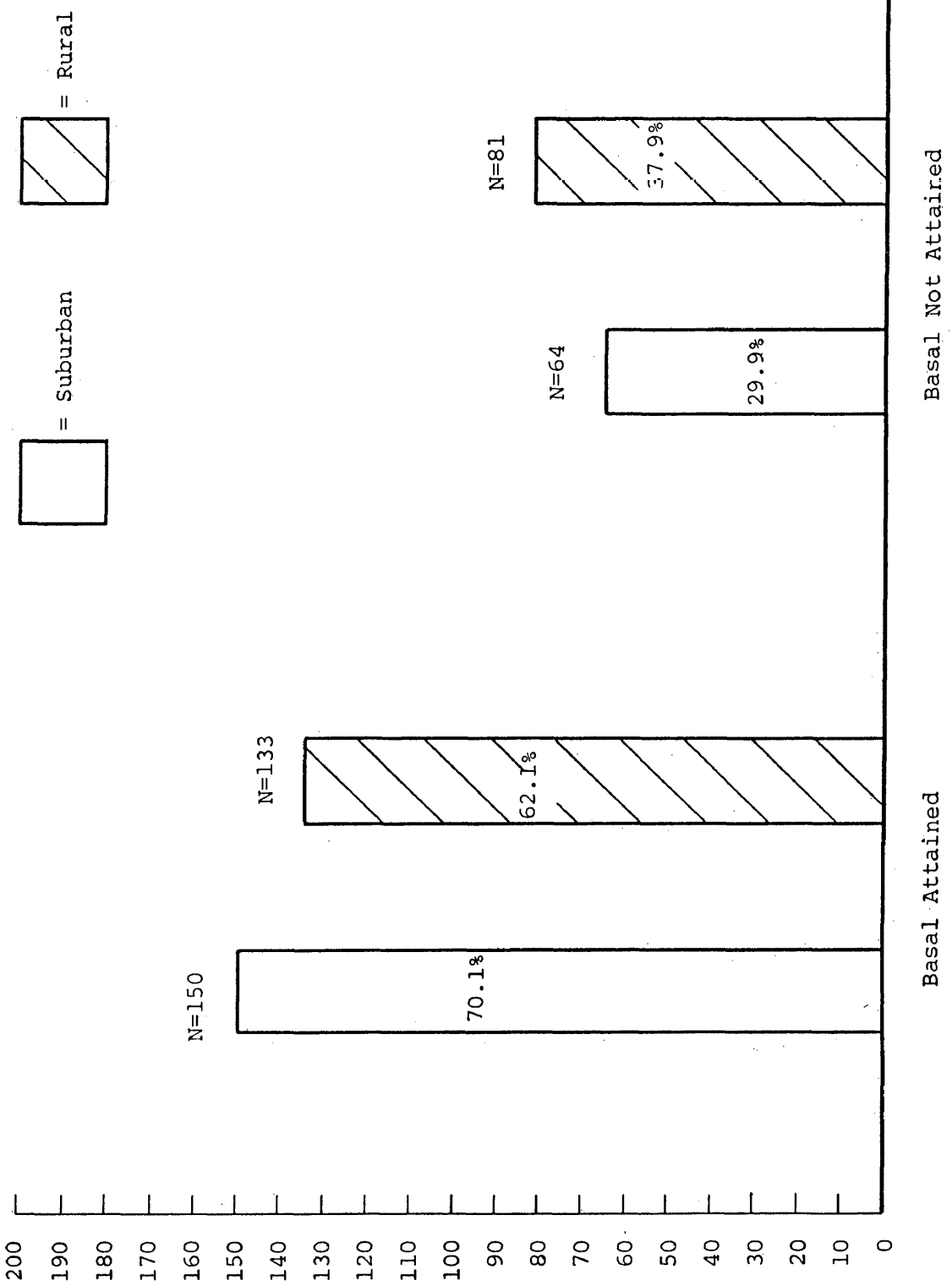


Table II

Descriptive Statistics Comparing Auditory Age in Months, Verbal Age in Months, and Language Age in Months, for Both Groups

Variable	N	Mean	S.D.	Min.	Max.	Range
Auditory Age						
Rural	214	64.70	7.08	42	81	39
Suburban	214	67.49	5.51	51	81	30
Verbal Age						
Rural	214	63.90	7.79	36	81	45
Suburban	214	69.29	7.31	51	84	33
Language Age						
Rural	214	64.49	6.88	40	81	41
Suburban	214	68.63	5.59	54	83	29

lower than that of the suburban group. In comparing language age, which is a composite score of auditory age and verbal age, a mean score of 64.5 months representing a 4.1 month deficit in the rural group was found.

Descriptive statistics comparing mean scores of auditory quotients, verbal quotients and overall language quotients for both groups are found in Table III. Suburban children attained 6.03 higher mean quotients on auditory comprehension, 10.33 higher mean quotients on verbal ability and 8.27 higher mean quotients on overall language skills.

Table IV presents percentages of pass and fail for both groups, together with combined groups pass and fail percentages for each item tested on the Zimmerman Preschool Language Scale. At the four year level, seven items had passing percentages ranging from 87% - 99%. The remaining item, V41, "repeats two sentences verbatum," which is a short term auditory memory item, had a combined group passing percentage of 77.3. The rural group, on item V41, had 73.4% passing and the suburban group 81.3% passing. The widest margin of difference at the four year level between the two groups was found on item V44, "counts to ten." Rural children passed this item at a rate of 87.4% and suburban children at 95.8%, an 8.4% difference between groups.

At the four and one-half year level, seven items had passing percentages ranging from 81% - 99%. The remaining item, A4.54, "understands use of seven items," is identical to A44 (four year level) in asking the child to point to the picture that "swims in the water (fish), tells time (clock), etc." At the four year level the child must

Table III

Descriptive Statistics Comparing Auditory Quotients, Verbal Quotients and Language Quotients for Both Groups

Variable	N	Mean	S.D.	Min.	Max.	Range
Auditory Quotients						
Rural	214	106.21	12.84	64	139	75
Suburban	214	112.24	10.52	84	145	61
Verbal Quotients						
Rural	214	104.95	14.03	61	144	83
Suburban	214	115.28	12.79	78	150	72
Language Quotients						
Rural	214	105.88	12.60	64	139	75
Suburban	214	114.15	10.33	83	148	65

Table IV

Descriptive Statistics Comparing Individual Item Scores for Both Subgroups and the Combined Population Tested

Variable	Group	N	Mean	S.D.	% Pass	% Fail
A41 - Recognizes one color	Rural	214	0.977	0.151	97.7	2.3
	Suburban	214	0.981	0.136	98.1	1.9
	Combined	428	0.979	0.144	97.9	2.1
A42 - Distinguishes four prepositions	Rural	214	0.902	0.298	90.2	9.8
	Suburban	214	0.935	0.248	93.5	6.5
	Combined	428	0.918	0.274	91.8	8.2
A43 - Differentiates texture	Rural	214	0.939	0.239	93.9	6.1
	Suburban	214	0.944	0.231	94.4	5.6
	Combined	428	0.942	0.235	94.2	5.8
A44 - Understand use of five items	Rural	214	0.958	0.201	95.8	4.2
	Suburban	214	0.977	0.151	97.7	2.3
	Combined	428	0.967	0.178	96.7	3.3
V41 - Repeats two sentences verbatum	Rural	214	0.734	0.443	73.4	26.6
	Suburban	214	0.813	0.391	81.3	18.7
	Combined	428	0.773	0.419	77.3	22.7
V42 - Orally gives two opposites	Rural	214	0.939	0.239	93.9	6.1
	Suburban	214	0.986	0.118	98.6	1.4
	Combined	428	0.963	0.190	96.3	3.7
V43 - Comprehends three physical needs	Rural	214	0.888	0.316	88.8	11.2
	Suburban	214	0.958	0.201	95.8	4.2
	Combined	428	0.923	0.267	92.3	7.7
V44 - Counts to ten	Rural	214	0.874	0.333	87.4	12.6
	Suburban	214	0.958	0.201	95.8	4.2
	Combined	428	0.916	0.278	91.6	8.4
A4.51 - Recognizes four colors	Rural	214	0.879	0.326	87.9	12.1
	Suburban	214	0.953	0.212	95.3	4.7
	Combined	428	0.916	0.278	91.6	8.4

Table IV (continued)

Variable	Group	N	Mean	S.D.	% Pass	% Fail
A4.52 - Touches left thumb to right thumb	Rural	214	0.818	0.387	81.8	18.2
	Suburban	214	0.864	0.343	86.4	13.6
	Combined	428	0.841	0.366	84.1	15.9
A4.53 - Understands concept of "three"	Rural	214	0.869	0.338	86.9	13.1
	Suburban	214	0.963	0.190	96.3	3.7
	Combined	428	0.916	0.278	91.6	8.4
A4.54 - Understands use of seven items	Rural	214	0.533	0.500	53.3	46.7
	Suburban	214	0.570	0.496	57.0	43.0
	Combined	428	0.551	0.498	55.1	44.9
V4.51 - Repeats four digits	Rural	214	0.813	0.391	81.3	18.7
	Suburban	214	0.883	0.322	88.3	11.7
	Combined	428	0.848	0.359	84.8	15.2
V4.52 - Orally gives three opposites	Rural	214	0.813	0.391	81.3	18.7
	Suburban	214	0.907	0.292	90.7	9.3
	Combined	428	0.860	0.348	86.0	14.0
V4.53 - Comprehends senses	Rural	214	0.925	0.264	92.5	7.5
	Suburban	214	0.986	0.118	98.6	1.4
	Combined	428	0.956	0.206	95.6	4.4
V4.54 - Comprehends remote events	Rural	214	0.897	0.304	89.7	10.3
	Suburban	214	0.981	0.136	98.1	1.9
	Combined	428	0.939	0.239	93.9	6.1
A51 - Comprehends direction "right"	Rural	214	0.636	0.482	63.6	36.4
	Suburban	214	0.673	0.470	67.3	32.7
	Combined	428	0.654	0.476	65.4	34.6
A52 - Taps rhythm	Rural	214	0.738	0.441	73.8	26.2
	Suburban	214	0.799	0.402	79.9	20.1
	Combined	428	0.769	0.422	76.9	23.1
A53 - Distinguishes weight differences	Rural	214	0.949	0.221	94.9	5.1
	Suburban	214	0.963	0.190	96.3	3.7
	Combined	428	0.956	0.206	95.6	4.4

Table IV (continued)

Variable	Group	N	Mean	S.D.	% Pass	% Fail
A54 - Knows eight body parts	Rural	214	0.729	0.446	72.9	27.1
	Suburban	214	0.822	0.383	82.2	17.8
	Combined	428	0.776	0.418	77.6	22.4
V51 - Names three coins	Rural	214	0.299	0.459	29.9	70.1
	Suburban	214	0.369	0.484	36.9	63.1
	Combined	428	0.334	0.472	33.4	66.6
V52 - Names six animals	Rural	214	0.752	0.433	75.2	24.8
	Suburban	214	0.855	0.353	85.5	14.5
	Combined	428	0.804	0.398	80.4	19.6
V53 - Comprehends senses	Rural	214	0.883	0.322	88.3	11.7
	Suburban	214	0.939	0.239	93.9	6.1
	Combined	428	0.911	0.285	91.1	8.9
V54 - Produces phonemes correctly at the five level	Rural	214	0.715	0.453	71.5	28.5
	Suburban	214	0.832	0.375	83.2	16.8
	Combined	428	0.773	0.419	77.3	22.7
A61 - Comprehends directional commands	Rural	214	0.416	0.494	41.6	58.4
	Suburban	214	0.458	0.499	45.8	54.2
	Combined	428	0.437	0.497	43.7	56.3
A62 - Can demonstrate number concepts to nine	Rural	214	0.724	0.448	72.4	27.6
	Suburban	214	0.813	0.391	81.3	18.7
	Combined	428	0.769	0.422	76.9	23.1
A63 - Distinguishes animal parts	Rural	214	0.528	0.500	52.8	47.2
	Suburban	214	0.636	0.482	63.6	36.4
	Combined	428	0.582	0.494	58.2	41.8
A64 - Adds numbers to five	Rural	214	0.589	0.493	58.9	41.1
	Suburban	214	0.673	0.470	67.3	32.7
	Combined	428	0.631	0.483	63.1	36.9
V61 - Repeats two series of four digits	Rural	214	0.678	0.469	67.8	32.2
	Suburban	214	0.776	0.550	77.6	22.4
	Combined	428	0.738	0.514	73.8	26.2

Table IV (continued)

Variable	Group	N	Mean	S.D.	% Pass	% Fail
V62 - Names eight animals	Rural	214	0.551	0.499	55.1	44.9
	Suburban	214	0.612	0.488	61.2	38.8
	Combined	428	0.582	0.494	58.2	41.8
V63 - Knows morning vs. afternoon	Rural	214	0.234	0.424	23.4	76.6
	Suburban	214	0.393	0.490	39.3	60.7
	Combined	428	0.313	0.464	31.3	68.7
V64 - Pronounces phonemes correctly at the six year old level	Rural	214	0.458	0.499	45.8	54.2
	Suburban	214	0.631	0.484	63.1	36.9
	Combined	428	0.544	0.499	54.4	45.6
A71 - Comprehends directional commands	Rural	214	0.140	0.348	14.0	86.0
	Suburban	214	0.229	0.421	22.9	77.1
	Combined	428	0.185	0.388	18.5	81.5
A72 - Counts number of taps for three series	Rural	214	0.136	0.343	13.6	86.4
	Suburban	214	0.266	0.443	26.6	73.4
	Combined	428	0.201	0.401	20.1	79.9
A73 - Value of three coins	Rural	214	0.014	0.118	1.4	98.6
	Suburban	214	0.014	0.118	1.4	98.6
	Combined	428	0.014	0.118	1.4	98.6
A74 - Adds and subtracts numbers to ten	Rural	214	0.089	0.285	8.9	91.1
	Suburban	214	0.131	0.338	13.1	86.9
	Combined	428	0.110	0.313	11.0	89.0
V71 - Repeats five digits	Rural	214	0.140	0.348	14.0	86.0
	Suburban	214	0.290	0.455	29.0	71.0
	Combined	428	0.215	0.411	21.5	78.5
V72 - Sentence building	Rural	214	0.079	0.271	7.9	92.1
	Suburban	214	0.140	0.348	14.0	86.0
	Combined	428	0.110	0.313	11.0	89.0
V73 - Knows address	Rural	214	0.257	0.438	25.7	74.3
	Suburban	214	0.467	0.500	46.7	53.3
	Combined	428	0.362	0.481	36.2	63.8

Table IV (continued)

Variable	Group	N	Mean	S.D.	% Pass	% Fail
V74 - Uses correct articulation in sentences	Rural	214	0.285	0.453	28.5	71.5
	Suburban	214	0.519	0.501	51.9	48.1
	Combined	428	0.402	0.491	40.2	59.8

correctly identify five of seven items and at the four and one-half year level the item is not repeated but all seven must have been correctly identified when administered at the four year level. On this item the rural group passed at a rate of 53.3% and the suburban group passed at a rate of 57.0%. Wide margins of differences in passing percentages were found on two items. On item A4.53, "understands concept of three," the suburban group had a 9.4% higher mean passing percentage than the rural group. On item V4.52, "knows three opposites," the suburban group had a 9.4% higher mean passing percentage than the rural group.

At the five year level, six of the items were passed with percentages ranging from 72% - 96%. However, one item, V51, "names three coins," had a combined passing percentage of only 33.4%; rural group 29.9% and suburban group 36.9%. On this item the child must correctly name three of the four coins presented: dime, nickel, penny and quarter. The remaining item at this level, A51, "comprehends direction right," had a combined passing percentage of 65.4%. The rural group passed this item at a rate of 63.6% and the suburban group passed at a rate of 67.3%. The widest margin of difference between the two groups at the five year level was found on item V54, "produces phonemes correctly at the five year old level." This item measures articulation proficiency on all consonants except the z, s, r, and th. Rural children passed this item at a rate of 71.5%, while suburban children passed at 83.2%, an 11.7% difference between groups.

Six items at the six year level were passed with percentages ranging from 46% - 81%. However, one item, V63, "knows morning versus

afternoon," had a combined group mean of 31.3%. The rural group passed this item at a rate of 23.4% and the suburban group passed at a rate of 39.3%. The remaining item, A61, "comprehends directional commands," tests body awareness, differentiation of self and spatial orientation in asking the child to put his left hand on his left knee. The combined group rate of passing on this item was 43.7%; rural group 41.6% and suburban group 45.8%. The widest margin of difference between the two groups at the six year level was found on item V64, "pronounces phonemes correctly at the six year old level." This measures correct articulation of all consonant sounds. Rural children passed this item at a rate of 45.8% and the suburban children 63.1%, a between group difference of 17.3%.

The highest passing percentage mean for both groups at the seven year level was found on item V74, "uses correct articulation in sentences." The combined group average was 40.2%. The rural group passed this item at a rate of 28.5% and the suburban group 51.9%. This item had the widest margin of difference between the two groups at this level, that is 23.4%. The remaining seven items at the seven year level had passing percentages ranging from 1.4% - 36% for the combined groups score. Item A73, "knows value of three coins," had the lowest passing percentage of 1.4% for both groups. With the exception of the articulation in sentences item, the highest scores were seen on item V73, "knows address," with a combined average of 36.2%; rural group 25.7% and suburban group 46.7%.

Figure 2 is a graphic comparison of the percent passing in each group on the 20 auditory comprehension items. Figure 3 is an identical

Figure 2

Graph Comparing the % of Rural and Suburban Children passing the 20 Auditory Variables of the Zimmerman Preschool Language Scale

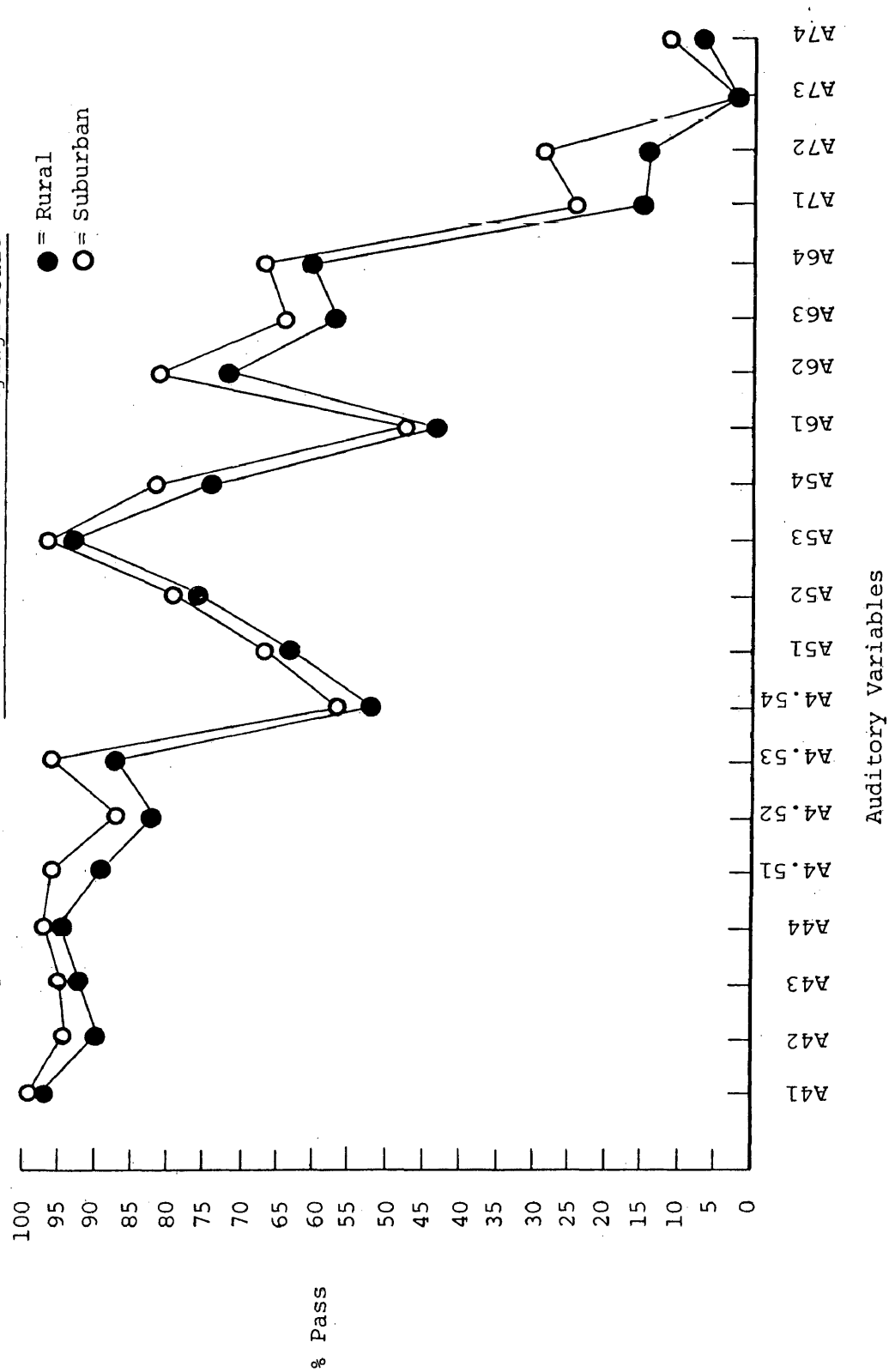
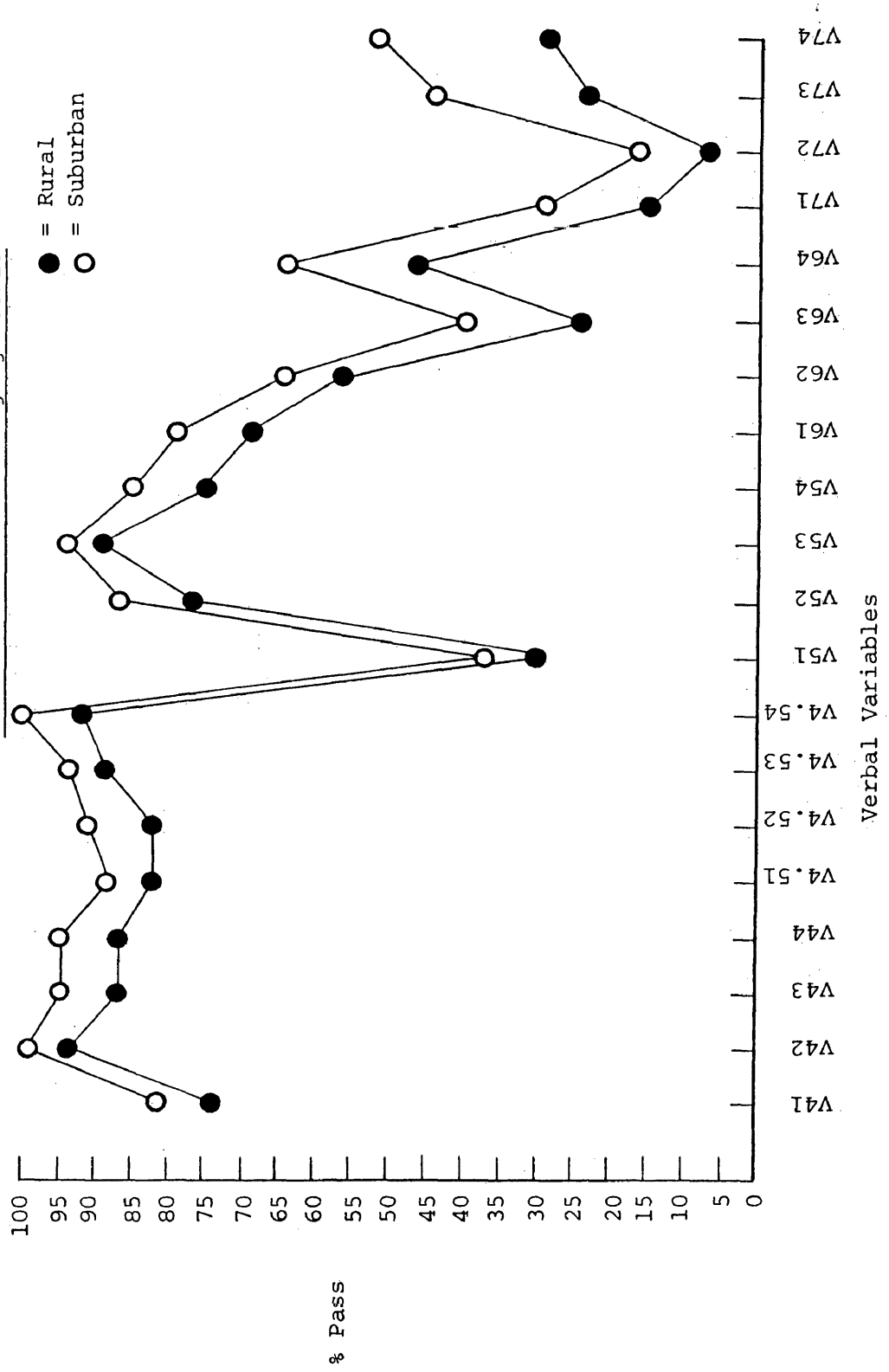


Figure 3

Graph Comparing the % of Rural and Suburban Children Passing the 20 Verbal Variables of the Zimmerman Preschool Language Scale



graph to that in Figure 2 for percent passing on the 20 verbal ability items of the Zimmerman Preschool Language Scale.

Univariate Analysis of Between Group Differences

The following reports the results of computer analysis using the S.P.S.S. subprogram T-test (Nie, et al., 1975). Table V presents the results of t-tests of mean difference for the variables of age and four year basal attainment for both groups. A t-value of 1.76 was not statistically significant at the .05 level for the variable of age. A t-value of 1.74 was not statistically significant at the .05 level for the variable of basal attainment.

Table VI presents the results of t-tests of mean difference on the variables of auditory age in months, verbal age in months and language age in months for both rural and suburban groups. A t-value of -4.54 was found to be significant at the .001 level of statistical significance on auditory age in months, with the suburban group scoring higher. The suburban group performed significantly better (.001 level) on verbal age in months with a t-value of -7.38. The third variable, language age in months, had a t-value of -6.82 and was found to be significant at the .001 level with the suburban group again scoring significantly higher.

Table VII presents the results of t-tests of mean differences on the variables of auditory quotient, verbal quotient and language quotient for both groups. A t-value of -5.31 was found to be significant at the .001 level for auditory quotients. The suburban group performed significantly better (.001 level) on verbal quotients with a

Table V

Results of t-tests of Mean Differences
for Age and Basal Attainment

Variable	Rural (N=214)		Suburban (N=214)			
	Mean	S.D.	Mean	S.D.	t	Probability
Age	60.89	4.29	60.20	3.71	1.76	.08
Basal Attainment	1.38	0.49	1.30	0.46	1.74	.08

Table VI

Results of t-tests of Mean Differences Comparing Auditory Age in Months, Verbal Age in Months and Language Age in Months for Both Groups

Variable	Group	N	Mean	S.D.	t	Probability
Auditory Age	Rural	214	64.7	7.1	-4.54	.001
	Suburban	214	67.5	5.5		
Verbal Age	Rural	214	63.9	7.8	-7.38	.001
	Suburban	214	69.3	7.3		
Language Age	Rural	214	64.5	6.9	-6.82	.001
	Suburban	214	68.6	5.6		

Table VII

Results of t-tests of Mean Differences Comparing Auditory Quotients, Verbal Quotients and Language Quotients for Both Groups

Variable	Group	N	Mean	S.D.	t	Probability
Auditory Quotient	Rural	214	106.2	12.8	-5.31	.001
	Suburban	214	112.2	10.5		
Verbal Quotient	Rural	214	104.9	14.0	-7.95	.001
	Suburban	214	115.3	12.8		
Language Quotient	Rural	214	105.9	12.6	-7.43	.001
	Suburban	214	114.2	10.3		

t-value of -7.95. The third variable, language quotient, had a t-value of -7.43 and was significant at the .001 level with the suburban group again scoring significantly higher.

Table VIII presents the results of t-tests of mean difference comparing both groups on the 40 items of the Zimmerman Preschool Language Scale. At the four year level no significant mean differences were found on the first four items (A41-A44). Significant mean differences at the .05 level were found on items V41, "repeats two sentences verbatum," (a short term auditory memory item) and on item V42, "orally gives two opposites." Significant mean differences at the .01 level were found on the last two items at this level, V43, "comprehends three physical needs," (what do you do when you are sleepy, etc.) and V44, "counts to ten." The suburban group scored significantly better in each instance.

The four and one-half year level revealed significant mean differences for all but two items; A4.52, "touches left thumb to right thumb," and A4.54, "understands use of seven items." One item was significant at the .05 level, V4.51, "repeats four digits," (a short term auditory memory item) with the suburban group scoring higher. Three items were significant at the .01 level: A4.51, "recognizes four colors," V4.52, "orally gives three opposites" and V4.53, "comprehends senses," (what do you do with your eyes, etc.). Two items were found to be significant at the .001 level: A4.53, "understands concept of three" and V4.54, "comprehends remote events," (what do you do it you have lost something). The suburban group performed significantly better in each instance.

The five year level contained four items that were not

Table VIII

Results of t-tests of Mean Differences Comparing Both Groups on 40 Items of the Zimmerman Preschool Language Scale

Variable	Group	N	Mean	S.D.	t	Probability
A41 - Recognizes one color	Rural	214	0.977	0.151	-0.34	N.S.
	Suburban	214	0.981	0.136		
A42 - Distinguishes four pre-positions	Rural	214	0.902	0.298	-1.23	N.S.
	Suburban	214	0.935	0.248		
A43 - Differentiates texture	Rural	214	0.939	0.239	-0.21	N.S.
	Suburban	214	0.944	0.231		
A44 - Understands use of five items	Rural	214	0.958	0.201	-1.09	N.S.
	Suburban	214	0.977	0.151		
V41 - Repeats two sentences ver-batatum	Rural	214	0.734	0.443	-1.97	.05
	Suburban	214	0.813	0.391		
V42 - Orally gives two opposites	Rural	214	0.939	0.239	-2.56	.05
	Suburban	214	0.986	0.118		
V43 - Comprehends three physical needs	Rural	214	0.888	0.316	-2.74	.01
	Suburban	214	0.958	0.201		
V44 - Counts to ten	Rural	214	0.874	0.333	-3.16	.01
	Suburban	214	0.958	0.201		
A4.51 - Recognizes four colors	Rural	214	0.879	0.327	-2.81	.01
	Suburban	214	0.953	0.212		
A4.52 - Touches left thumb to right thumb	Rural	214	0.818	0.387	-1.32	N.S.
	Suburban	214	0.865	0.343		
A4.53 - Understands concept of "three"	Rural	214	0.869	0.338	-3.53	.001
	Suburban	214	0.963	0.190		

Table VIII (continued)

Variable	Group	N	Mean	S.D.	t	Probability
A4.54 - Understands use of seven items	Rural	214	0.533	0.500	-0.78	N.S.
	Suburban	214	0.570	0.496		
V4.51 - Repeats four digits	Rural	214	0.813	0.391	-2.03	.05
	Suburban	214	0.883	0.322		
V4.52 - Orally gives three opposites	Rural	214	0.813	0.391	-2.80	.01
	Suburban	214	0.907	0.292		
V4.53 - Comprehends senses	Rural	214	0.925	0.264	-3.08	.01
	Suburban	214	0.986	0.118		
V4.54 - Comprehends remote events	Rural	214	0.897	0.304	-3.69	.001
	Suburban	214	0.981	0.136		
A51 - Comprehends direction "right"	Rural	214	0.636	0.482	-0.81	N.S.
	Suburban	214	0.673	0.470		
A52 - Imitates rhythmic taps	Rural	214	0.738	0.441	-1.49	N.S.
	Suburban	214	0.799	0.402		
A53 - Distinguishes weight differences	Rural	214	0.949	0.221	-0.70	N.S.
	Suburban	214	0.963	0.190		
A54 - Knows eight body parts	Rural	214	0.729	0.446	-2.33	.05
	Suburban	214	0.822	0.383		
V51 - Names three coins	Rural	214	0.299	0.459	-1.54	N.S.
	Suburban	214	0.369	0.484		
V52 - Names six animals	Rural	214	0.752	0.433	-2.69	.01
	Suburban	214	0.855	0.353		
V53 - Comprehends senses	Rural	214	0.883	0.322	-2.04	.05
	Suburban	214	0.939	0.239		

Table VIII (continued)

Variable	Group	N	Mean	S.D.	t	Probability
V54 - Produces phonemes correctly at the five year level	Rural	214	0.715	0.452	-2.91	.01
	Suburban	214	0.831	0.375		
A61 - Comprehends directional commands	Rural	214	0.416	0.494	-0.88	N.S.
	Suburban	214	0.458	0.499		
A62 - Can demonstrate number concepts to nine	Rural	214	0.724	0.448	-2.19	.05
	Suburban	214	0.813	0.391		
A63 - Distinguishes animal parts	Rural	214	0.528	0.500	-2.26	.05
	Suburban	214	0.636	0.482		
A64 - Adds numbers to five	Rural	214	0.589	0.493	-1.81	N.S.
	Suburban	214	0.673	0.470		
V61 - Repeats two series of four digits	Rural	214	0.678	0.469	-2.46	.05
	Suburban	214	0.780	0.550		
V62 - Names eight animals	Rural	214	0.551	0.499	-1.27	N.S.
	Suburban	214	0.612	0.488		
V63 - Knows morning vs. afternoon	Rural	214	0.234	0.424	-3.59	.001
	Suburban	214	0.393	0.489		
V64 - Pronounces phonemes correctly at the six year old level	Rural	214	0.458	0.499	-3.64	.001
	Suburban	214	0.631	0.484		
A71 - Comprehends directional commands	Rural	214	0.140	0.348	-2.38	.05
	Suburban	214	0.229	0.421		
A72 - Counts number of taps for three series	Rural	214	0.136	0.343	-3.42	.001
	Suburban	214	0.266	0.443		

Table VIII (continued)

Variable	Group	N	Mean	S.D.	t	Probability
A73 - Value of three coins	Rural	214	0.014	0.118	0.0	N.S.
	Suburban	214	0.014	0.118		
A74 - Adds and subtracts numbers to ten	Rural	214	0.089	0.285	-1.39	N.S.
	Suburban	214	0.131	0.338		
V71 - Repeats five digits	Rural	214	0.140	0.348	-3.82	.001
	Suburban	214	0.290	0.455		
V72 - Sentence building	Rural	214	0.079	0.271	-2.01	.05
	Suburban	214	0.140	0.348		
V73 - Knows address	Rural	214	0.257	0.438	-4.63	.001
	Suburban	214	0.467	0.500		
V74 - Uses correct articulation in sentences	Rural	214	0.285	0.452	-5.06	.001
	Suburban	214	0.519	0.501		

significant in mean differences: A51, "comprehends direction right," A52, "imitates rhythmic taps," A53, "distinguishes weight differences" and V51, "names three coins." Two items were significant at the .05 level: A54, "knows eight body parts" and V53, "comprehends senses." Two items were significant at the .01 level: V52, "names six animals" and V54, "produces phonemes correctly at the five year level (articulation proficiency on all consonants except z, s, r, and th). On each five year level item with significant mean differences, the suburban group performed better.

Three of the eight items at the six year level did not show significant between group mean differences, i.e., A61, "comprehends directional commands (put your left hand on your left knee), A64, "adds numbers to five" (an abstract thought question), and V62, "names eight animals in one minute." Significant mean differences at the .05 level were found on three items at this level, i.e., A62, "can demonstrate number concepts to nine," A63, "distinguishes animal parts (show me the one with a bushy tail, etc.) and V61, "repeats two series of four digits" (a short term auditory memory task). Two items were significant at the .001 level, i.e., V63, "knows morning versus afternoon" (do you eat breakfast in the morning or in the afternoon, etc.) and V64, "pronounces all consonant sounds correctly." Again the suburban group performed better on each six year level item where a significant between group mean difference was found.

At the seven year level two of the eight items did not show significant between group differences: A73, "knows value of three coins" and A74, "adds and subtracts numbers to ten (an abstract thought

question). One item, A71, "comprehends directional commands (touch your right thumb to your right little finger), was significant at the .05 level. Four items were significant at the .001 level, i.e., A72, "counts number of taps for three series," A71, "repeats five digits" (a short term auditory memory item), V73, "knows address" and V74, "uses correct articulation in sentences." On all seven year level items containing significant between group differences, the suburban group performed better.

Multivariate Analysis

Stepwise multivariate discriminant analysis was carried out on the data using the computer and the S.P.S.S. subprogram Discriminant (Nie, et al., 1975). A single discriminant function was found between rural and suburban children when the six composite scores (auditory age, verbal age, language age, auditory quotient, verbal quotient and language quotient) were considered in mulivariate analysis. The degree of significance of the multivariate discriminant function was tested using a chi-square test of significance. Table IX shows the magnitude of the chi-square to be 59.99 with two degrees of freedom. The statistical significance of the multivariate discriminant analysis was beyond the .001 level. The two ranked variables of the six composite scores which were found to best discriminate between the two groups in multivariate analysis (Table X) were, first, verbal quotient and second, language age in months. These two scores represent a multivariate subset of the six composite scores which account for maximum separation between the two groups, even though all six composite scores were found to be

Table IX

Multivariate Stepwise Discriminant Analysis of the Six Overall Language Scores of the Zimmerman Preschool Language Scale

chi-square (df=2)	Probability
59.99	.001

Table X

Two Item Multivariate Subset of the Six Overall Language Scores, Ranked in Order of Their Contribution to the Significant Discriminant Function

Variable	Discriminant Function Coefficients
1) Verbal Quotient	0.817
2) Language Age	0.220

statistically significant in univariate analysis (Tables VI and VII).

Table XI presents the results of stepwise multivariate discriminant function analysis between rural and suburban children when the 40 tested items of the Zimmerman Preschool Language Scale were pooled in multivariate analysis. One discriminant function was identified in the data and again was tested using chi-square. The magnitude of the chi-square was 78.44, with seventeen degrees of freedom. The statistical significance of the multivariate discriminant function was beyond the .001 level. Table XII presents, in rank order, the seventeen variables of the 40 test items which were found to best discriminate between the two groups. These variables, ranked in order, are: (1) V74, (2) V73, (3) A4.53, (4) V71, (5) V52, (6) V62, (7) V4.54, (8) V63, (9) A72, (10) A43, (11) A53, (12) V51, (13) A62, (14) V4.53, (15) A73, (16) A52, and (17) A51. These seventeen variables represent a multivariate subset of the 40 tested items which account for maximum separation between groups, even though 25 of the items were found to be statistically significant in univariate analysis beyond the .05 level (see Table VIII).

Table XI

Results of Multivariate Stepwise Discriminant Analysis of the 40 Tested Items of the Zimmerman Preschool Language Scale

chi-square (df=17)	Probability
78.44	.001

Table XII

Seventeen Item Multivariate Subset of the 40 Tested Items, Ranked in Order of Their Contribution to the Significant Discriminant Function

Variable		Discriminant Function Coefficients
1)	V74	-0.403
2)	V73	-0.372
3)	A4.53	-0.315
4)	V71	-0.252
5)	V52	-0.244
6)	V62	-0.237
7)	V4.54	-0.234
8)	V63	-0.224
9)	A72	-0.212
10)	A43	0.204
11)	A53	0.176
12)	V51	-0.173
13)	A62	0.156
14)	V4.53	-0.156
15)	A73	0.144
16)	A52	0.132
17)	A51	-0.118

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

This study was designed to determine if there would be statistically significant differences (.05 level) between rural and suburban pre-kindergarten children in their responses to test items designed to assess language development. Two hundred and fourteen rural and 214 suburban children, during the five year period (1973-1977), were screened at "Kindergarten Roundups" in areas of vision, hearing, motor development, articulation and language development. Definition of and selection of subjects is presented in Chapter 3.

The area of interest to this study was language development, as assessed by the Zimmerman Preschool Language Scale (Zimmerman, Steiner and Evatt, 1969). The parameters measured included: performance on 40 individual items, overall language age in months, auditory comprehension age in months, verbal ability age in months, overall language quotients, auditory comprehension quotients, verbal ability quotients and ability to achieve four year basal attainment (discussion of these items can be found on page 23).

All data were keypunched and computer analyzed at the Omaha computing facility of the University of Nebraska at Omaha on the IBM 370 computer. Data analyses performed were: (1) subprogram Frequencies, yielding descriptive statistics, (2) subprogram T-tests, providing statistical analyses of between group mean differences and (3) subprogram Discriminant, which performed stepwise multivariate

discriminant analyses between the rural and suburban subjects from the Statistical Package For The Social Sciences, version 7.0 (Nie, et al., 1975).

Two major null hypotheses were tested in regard to the data collected:

1. Four to five year old children from rural schools versus suburban community schools will not be differentiated (.05 level) on the basis of their speech and language performance as assessed by several of the components of the Zimmerman Preschool Language Scale (see pages 24 and 25).

2. There will be no significant difference (.05 level) between rural and suburban children on the variable of four year basal attainment on the Zimmerman Preschool Language Scale.

The Zimmerman Preschool Language Scale assesses the natural dichotomy between auditory comprehension and verbal ability, each of which is given an age placement on the basis of empirical evidence of the average age of attainment by preschool and early primary children. The review of the literature in this study (Chapter 2) was divided into three sections: 1) receptive language (auditory comprehension), 2) expressive language (verbal ability) and 3) environmental and socioeconomic influences on language attainment.

In regard to age, it is important to remember that there was no statistically significant difference (.05 level) between the two groups (Table V). The mean age of the rural group in fact, was somewhat higher (.7 of a month, see Table I) than the suburban group, despite the fact that in all areas where significant differences were seen, the

suburban group scored higher than the rural group.

The first null hypothesis was rejected with the following data. Statistically significant between group mean differences at the .001 level were found in performance of t-tests on all six of the composite scores (Tables VI and VII). Mean score values of the suburban group were shown to be higher on all six composite scores: 2.8 months higher in auditory age, 5.4 months higher in verbal age, 4.1 months higher in overall language age, 6.03 higher in auditory quotients, 10.33 higher in verbal quotients and 8.27 higher in overall language quotients than their rural counterparts (Tables II and III). When the six composite scores were considered in stepwise multivariate discriminant analysis, two variables were found to best discriminate between the two groups, i.e., first, verbal quotient, and second, language age in months (Table X). This function was found to be significant beyond the .001 level of statistical significance (Table IX). It is interesting that verbal quotient was the highest ranked indicator of the difference between the two groups, as this is a measure of strictly verbal responses. Language age in months is the composite score of auditory age in months and verbal age in months, and one might assume that this would be the highest ranked indicator of difference between groups. However, it was the second best discriminator.

In looking at the 40 tested items of the Zimmerman Preschool Language Scale, one finds some seemingly misplaced items in regard to age level attainment in this population. The mean age of both groups was a little above 60 months (five years of age). At the four year level (Table IV), the combined group mean of passing percentage was

above 90% except for item V41, "repeats two sentences verbatum," a short term auditory memory item, which had 77% passing. This item does not appear to meet the 90% plus passing percentages that were found on the other seven items of the four year level and might be better placed at a higher age level.

At the four and one-half year level the combined passing percentages of both groups were between 84% and 96%, except for one item, A4.54, "understands use of seven items," which had a combined passing percentage of 55% (Table IV). This appears to be too difficult an item for this age level in comparison to the other seven items and might also be better placed at a higher age level.

At the five year level, the combined group passing percentage was between 77% and 96% on six of the items (Table IV). One item, V51, "names three coins," appears not to be descriptive of children this age in the population sampled. Only 33% of the combined group passed this item and its age placement is also questioned. The remaining item at this five year level, A51, "comprehends direction right," had a combined passing percentage of 65%. This item is 17% below the first six items and indicates a fairly questionable placement at this level.

The six year level found the combined group passing percentage between 54% and 77% on six items (Table IV). One item, V63, "knows morning versus afternoon," had a combined passing percentage of 31%. This item might be better placed at a higher age level. The remaining item, A61, "comprehends directional commands," might also be better placed at a higher level, as it had a combined group passing percentage of only 44%.

At the seven year level, one item, A73, "knows value of three coins" (how many pennies or cents are in a nickel, dime, quarter and half-dollar), was by far, the most difficult item encountered by the children in this study. Only 1% of each group passed this item (Table IV). With the exception of V74, "uses correct articulation in sentences," which had a passing percentage of 40%, the combined group passing percentages on the remaining seven items ranged from 1% to 36%. These items clearly are beyond the competency of this five year old population, as one might expect.

The results of t-tests of mean differences comparing both groups on the 40 tested items of the Zimmerman Preschool Language Scale (Table VIII) found the suburban group scoring significantly better (.05 level) on 10 items. Statistical significance at the .01 level was found on seven items and on eight items statistical significance at the .001 level was found.

In looking more closely at the items found to be statistically significant, only five general auditory comprehension concepts were significant, while eleven general verbal ability concepts were found to be significant.

In the area of auditory comprehension, the concepts of 1) recognition of four colors (A4.51), 2) understands number concepts (A4.53, A62 and A72), 3) knows eight body parts (A54), 4) distinguishes animal parts (A63), and 4) comprehends directional commands (A71), were statistically significant.

In the area of verbal ability, the concepts of 1) short term auditory memory (V41, V4.51, V61, and V71), 2) knows opposites (V43),

3) comprehends three physical needs (V43), 4) counts to ten (V44), 5) comprehends senses (V4.53 and V53), 6) comprehends remote events (V4.54), 7) names six animals from memory (V52), 8) knows morning versus afternoon (V63), 9) sentence building (V72), 10) knows address (V73) and 11) all levels of articulation proficiency (V54, V64 and V74) were statistically significant.

When the 40 tested items of the Zimmerman Preschool Language Scale were considered in multivariate analysis, the statistical significance of the single discriminant function was beyond the .001 level (Table XI). Seventeen variables of the test were found to best discriminate between the two groups. These seventeen items, ranked in order, were: 1) correct sentence articulation, 2) knows address, 3) understands concept of "three," 4) repeats five digits, 5) names six animals, 6) names eight animals, 7) comprehends remote events, 8) knows morning versus afternoon, 9) counts number of taps for three series, 10) differentiates texture, 11) distinguishes weight differences, 12) names three coins, 13) demonstrates number concepts to nine, 14) comprehends senses, 15) knows value of three coins, 16) imitates rhythmic taps and 17) comprehends direction "right" (Table XII).

The second null hypothesis was supported in regard to four year basal attainment. Results of t-tests of mean difference (Table V) showed no significant mean difference between groups. Figure 1 shows the suburban group passing the four year basal item at a rate of 70% while their rural counterparts achieved this item 62% of the time.

In summary, the data reveals that rural children, in this study, had much more difficulty with questions requiring verbal skills than

those questions requiring motor responses in assessing their language skills. This supports the findings of McConnell and Robertson (1970). The data also reveals that the Zimmerman Preschool Language Scale seems to discriminate against rural children. Suburban children consistently achieved higher, significant mean scores than rural children even though the rural group was slightly older in mean chronological age. It may, however, lend support to demographic influences causing language delays as reported by Nurss and Day (1970) and Shipman (1978).

Practical Implications

The usefulness of the Zimmerman Preschool Language Scale as a screening device, even with pre-kindergarten children, is not being disputed. One must remember that the test was normed on children up to seven years of age and the population sampled in this study had a mean age of five years. The instrument takes only 20 minutes to administer and breaks down overall language into the dichotomous components of expressive and receptive skills.

This encourages one to look closely at the criteria for pass-fail when using this instrument as a screening device. The test itself does not indicate pass-fail levels, but one assumes that if the child attains at or above age in months scores on auditory age and verbal age, in comparison to that of chronological age, he has passed. The age in months scores are used in deriving auditory, verbal and overall language quotients.

Clinicians administering the Zimmerman Preschool Language Scale to the children used in this study, chose a criterion for passing of 98

or above on all three quotient scores (auditory, verbal and overall language). If one or more of the quotient scores was below 98, the child was referred for a more indepth language assessment. Looking at these three scores individually helps in the decision process for recommending further diagnostics. If only the verbal quotient falls below 98, the referral can specifically state a need for further expressive language assessment. Likewise, if only the auditory quotient falls below 98, the referral can specify a need for further receptive language assessment. If very depressed scores are seen on all quotient scores, a more comprehensive psychological evaluation would be recommended.

Establishing the four year level for basal attainment was another criterion used in this study. This was explained in Chapter 3, but in synopsis, if the child did not attain four year basal he was taken back to the three and one-half year level and so on until basal was attained. If not attaining four year basal had been used as criterion for ceasing screening, 38% of the rural population and 30% of the suburban population would have been referred for indepth language assessment (Figure 1). This percentage of each group seems quite large when considering referral for indepth language assessment.

This writer would suggest if using the Zimmerman Preschool Language Scale with pre-kindergarten children similar to the population found in this study, the following protocol be followed: 1) start at a basal level that compares to the child's chronological age and if this level is not attained, progressing backward until a basal can be attained; 2) maintain the minimum attainment of 98 quotient scores for verbal ability, auditory comprehension and overall language, to assist

in determining the type of referral to be made for more indepth assessment; and 3) look closely at both verbal ability and auditory comprehension quotients, comparing the two in regard to discovering a wide margin of difference which might indicate a difficulty in one of the areas even though both scores may be above the arbitrary fail criterion of 98.

This writer also believes closer attention must be given to the six items found to be seemingly misplaced between the four and six year levels if this test is used with a population similar to that of this study. Three auditory comprehension and three verbal ability questions were found not to be descriptive of children in this study.

The first item, V41, "repeats two sentences verbatum," measures immediate auditory recall and memory span for meaningful material of 12-13 syllable sentences. This four year level item is much more difficult than the auditory memory items found at the four and one-half and six year levels of repeating four digits verbatum. Therefore, if item V41 is missed it is recommended that the other auditory memory items found in this test, V4.51, V61 and V71, be looked at to determine the level of auditory memory problems suspected.

The second item, A4.54, "understands use of seven items," contains some articles that are easily comprehended and some that are rather misleading. The child is told to point to the one that "swims in the water" (fish), "tells time" (clock), "we write with" (pencil), "we read" (book) and "we cut with" (knife), which are seemingly easy to identify. The other two items are more difficult to identify. 1) "Point to the one we put two pieces of wood together with" (hammer and

nail), contains two pictures that must both be identified and contains a lengthy phrase which must be interpreted, rather than two or three words. 2) "Point to the one we eat at" (table), is surrounded by other eating related articles (glass and knife) and tests the knowledge of the word "at." This item is given at the four year level and not repeated at the four and one-half year level. The four year level criterion is five correct of the seven articles presented. The passing criterion at the four and one-half year level is that all seven articles must have been correctly identified when administered at the four year level. It is suggested that this item be looked at more closely to determine if the two seemingly difficult articles caused failure of this item.

The third item, V51, "names three coins," assumes the availability of verbal symbols as pertinent labels for money objects. Demographically, the children in a population such as those in this study, do not have the availability of corner grocery stores where they can experience use of money at this age. Also the concept of purchasing items for a penny, nickel or dime no longer exists in our society to the extent that it did some years ago.

The fourth item, A51, "comprehends direction right" expects a child to correctly identify his right hand twice. This concept is taught as part of the kindergarten curriculum and knowledge of this concept would not be expected of pre-kindergarten children.

The fifth item, V63, "knows morning versus afternoon," elicits three responses, all of which must be correct for passing of this item. 1) "Do you eat breakfast in the morning or in the afternoon?" This is a relatively easy question for most pre-kindergarten children. 2) "Do

boys and girls come home from school in the morning or in the afternoon?" Many pre-kindergarten children have siblings or playmates that attend morning kindergarten classes and come home before noon or have siblings or playmates that come home for lunch. Many rural children have no older siblings or close neighbors to draw knowledge of differentiation from in answering this question. 3) "When does afternoon start?" This question has such a variety of acceptable answers that it is hard to determine pass or fail for many preschool children. Easily identified correct answers include, noon, twelve o'clock and lunch or dinner time. Other answers may be just as correct, but knowledge of these by the examiner is not always available. Such answers include: "when Sesame Street starts" (some television stations show this at noon); "when the whistle blows" (in many small communities a noon whistle is sounded); and "when dad comes home to eat" (many farmers come in from their work for lunch). These are just a few of the responses that may be correct differentiation of "when does afternoon start," but the examiner's lack of knowledge of these may cause failure of this item.

The sixth item A61, "comprehends directional commands" (put your left hand on your left knee), like item A51, expects pre-kindergarten children to have acquired right-left orientation. Perhaps this concept can not be expected of children this age.

All six of these items should be carefully examined by the person administering this test before determining failure of a child. If all six of these items are missed a recommendation to use another instrument should be made.

RECOMMENDATIONS FOR FUTURE RESEARCH

If this study were to be replicated, it is suggested that sex of both groups be included in the investigation of data to determine if:

1) rural boys achieve equal mean scores with suburban boys on the six composite scores derived

2) rural girls achieve equal mean scores with suburban girls on the six composite scores derived

3) all boys compare with all girls when comparing mean scores on the six composite scores derived

The group selected for this study consisted of 111 males and 103 females in the suburban group and the rural group was perfectly distributed (by chance) with 107 males and 107 females.

To determine if the Zimmerman Preschool Language Scale does discriminate against rural children, a study using the Zimmerman Preschool Language Scale together with another language assessment tool but with the two distinct populations remaining the same, should affirm or deny the discrimination factor. Subjects should reside within the same geographic area as the subjects for this study. If similar results are obtained, the demographic influence factor would be substantiated further.

Another recommendation for future research would be selecting like groups in other sections of Nebraska, using the same tool for assessment, to determine if the findings are consistent throughout the state. Comparing Nebraska pre-kindergarten rural and suburban children to those in other states may yield valuable information regarding

demographic influences on a national level.

The need for diversity in program planning by schools and servicing agencies to those schools in the geographic area covered in this study is apparent. If, in fact, language skills are a primary basis for academic learning, results of this study would indicate that rural children need more selective emphasis on structured language development programs for their success in school to be equal to their suburban counterparts.

BIBLIOGRAPHY

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APPENDIX

Zimmerman Preschool Language Scale

Name _____

School _____ Room _____

Teacher _____

Parent or Guardian _____

Address _____ Phone _____

City _____ State _____

Examiner _____

Birthdate _____

Age _____

AC Age _____ ACQ _____

VA Age _____ VAQ _____

Language Age _____

Language Q _____

Date Administered:

Family and Environmental Notes:

Comments:

4 Years (Four tests, one and one-half months each)

AUDITORY COMPREHENSION

___1. Recognizes Colors
(Four colored blocks)
(Same as 4 years, 6 months, item no. 1)

Show me:

the RED block ___,

the BLUE block ___,

the YELLOW block ___,

the GREEN block ___.

(One is passing.)

___2. Distinguishes Prepositions
(One block)
(Same as 3 years, item no. 2)

Put the block:

a. on the chair___,

b. under the chair ___,

c. in front of the chair___,

d. beside the chair___,

e. in back of the chair___.

(Four is passing.)

___3. Differentiates Texture
(Sandpaper and Smooth Surface)

Which is smoother___?

Which is rougher___?

(Two is passing.)

VERBAL ABILITY

___1. Repeats Sentences

Can you say I am a big boy (girl)?

a. Mary and I feed our little dog every day ___.

b. My mother and father went to the store today ___.

c. Our mother washes the dishes and sweeps the floor ___.

(Two is passing.)

___2. Knows Opposites
(Same as 4 years, 6 months, item no. 2)

a. Brother is a boy, sister is a _____

b. In daytime it is light, at night it is_____,_____

c. Father is a man, mother is a____, ____

d. The snail is slow, the rabbit is ____, ____

e. The sun shines during the day, the moon at ____, ___

(Two is passing.)

___3. Comprehends Physical Needs
(Same as 3 years, item no. 3 and 3 years, 6 months, item no. 3)

What do you do when you are:

a. sleepy___,

b. hungry___,

c. cold___?

(Three is passing.)

4 Years (Four tests, one and one-half months each) (continued)

AUDITORY COMPREHENSION

___4. Understands Use (II)
(Picture Number 14)
(Same as 4 years, 6 months, item no. 4)

Show me which one:

a. swims in the water___,

b. tells time___,

c. we write with___,

d. we read___,

e. we eat at___,

f. we put two pieces of wood together with___,

g. we cut with___.

(Five is passing.)

VERBAL ABILITY

___4. Counts to Ten

Do you know how to count? (or)

Let us say 1-2-3.....

_____

(Counts to ten.)

4 Years, 6 Months (Four tests, one and one-half months each)

AUDITORY COMPREHENSION

___1. Recognizes Colors
(Four colored blocks)
(Same as 4 years, item no. 1)

Show me:

the RED block___,

the BLUE block___,

the YELLOW block___,

the GREEN block___.

(Four is passing.)

___2. Touches Thumbs

Place your left thumb against your right thumb.

_____

(Passes if thumbs touch.)

___3. Understands the concept of the number "Three" (Twelve blocks)

Give me just three._____

(Gives just three blocks.)

VERBAL ABILITY

___1. Repeats Four Digits
(Same as 6 years, item no. 1)

Listen, say 3-4-2.

Now say: 7-2-8-1___,

2-1-6-4___,

6-5-9-8___.

Ignore faulty pronunciation.

(One is passing.)

___2. Knows Opposites
(Same as 4 years, item no. 2)

a. Brother is a boy, sister is a _____, ___

b. In daytime it is light, at night it is_____, ___.

c. Father is a man, mother is a_____, ___

d. The snail is slow, the rabbit is_____, ___

e. The sun shines during the day, the moon at____, ___

(Three is passing.)

___3. Comprehends Senses
(Same as 5 years, item no. 3)

What do we do with:

our eyes___,

our ears___?

(One is passing.)

4 Years, 6 Months (Four tests, one and one-half months each) (continued)

AUDITORY COMPREHENSION

___4. Understands Use (II)
(Picture Number 14)
(Same as 4 years, item no. 4)

Show me which one:

a. swims in the water___,

b. tells time___,

c. we write with___,

d. we read___,

e. we eat at___,

f. we put two pieces of wood toegether with___,

g. we cut with___.

(Seven is passing.)

VERBAL ABILITY

___4. Comprehends Remote Events

What do you do:

when you have lost something___,

before you cross the street___?

(One is passing.)

5 Years (Four tests, one and one-half months each)

AUDITORY COMPREHENDSION

___1. Comprehends Right

Show me your right hand____

Ask twice, separated by another item.

(Two is passing.)

___2. Taps Rhythm

Can tap table in imitation of examiner:

a. Tap twice.___

b. Tap four times.___

c. Tap three times.___

(Two is passing.)

___3. Distinguishes Weight Differences
(Picture Number 15)

Point to the one which is heavier:

a. a bird or a cow___

b. a bed or a chair___

c. a boot or a shoe___

d. a car or a dump truck___

e. a lock or a leaf___

(Four is passing.)

___4. Knows Body Parts

Show me your:

head___ eyebrow___

arm___ little finger___

hand___ elbow___

knee___

heel___

palm___

chin___

(Eight is passing.)

VERBAL ABILITY

___1. Knows Coins
(Nickel, Penny, Quarter, Dime)

What is this: nickel___,

penny___, quarter___, dime___?

(Three is passing.)

___2. Names Animals
(Same as 6 years, item no. 2)

Name all the animals you can think of until I tell you to stop._____

_____

(Six is passing; must name six in one minute.)

___3. Comprehends Senses
(Same as 4 years, 6 months, item no. 3)

What do we do with:

our eyes___,

our ears___?

(Two is passing.)

___4. Pronounces Sounds Correctly III

_____

(Passes Articulation Section Groups I, II, III.)

6 Years (Four tests, three months each)

AUDITORY COMPREHENSION

___1. Comprehends Directional Commands (1)

Put your left hand on your left knee.

_____

(Responds correctly on one trial

___2. Counts Blocks (Twelve blocks)

Can you put___blocks here?

3___0___5___7___

(Three is passing.)

___3. Distinguishes Animal Parts (Picture Number 16)

Which one has:

a. the longest nose___,

b. a bushy tail___,

c. pointed ears___,

d. a long, thin tail___?

(Four is passing.)

___4. Adds numbers up to Five

If you have one penny and I give you one more penny, how many will you have___?

If you have two pennies and I give you two more pennies, how many will you have___?

If your have three pennies and I give you two more pennies, how many will you have___?

(Two is passing.)

VERBAL ABILITY

___1. Repeats Four Digits (Same as 4 years, 6 months, item no. 1)

Say, 3-4-2.

Now say: 7-2-8-1___,

2-1-6-4___,

6-5-9-8___.

Ignore faulty pronunciation.

(Two is passing.)

___2. Names Animals (Same as 5 years, item no. 2)

Name all the animals you can think of until I tell you to stop_____.

(Eight is passing; must name eight in one minute.)

___3. Knows Morning Versus Afternoon

Do you eat breakfast in the morning or in the afternoon_____?

Do boys and girls come home from school in the morning or in the afternoon_____?

When does afternoon start____?

(Three is passing.)

___4. Pronounces Sounds Correctly (IV)

_____

(Passes Articulation Section Groups I, II, III, and IV.)

7 Years (Four tests, three months each)

AUDITORY COMPREHENSION

___1. Comprehends Directional Commands (II)

Touch your right thumb with your right little finger.____

(Responds correctly on one trial.)

___2. Counting Taps

Listen. (Tap twice.) How many times did I tap? Now listen. How many this time?

a. Tap seven times.___

b. Tap five times.___

c. Tap eight times.___

(Three is passing.)

___3. Coin Values (Dime, Nickel, Quarter, Half Dollar, and Picture Number 17)

Look at this money. Can you tell me how many pennies are in a:

a. dime___

b. nickel___

c. quarter___

d. half dollar___

(Three is passing.)

___4. Adds and Subtracts numbers up to Ten (Picture Number 17)

If you had ten pennies and gave away four, how many would you have___?

If you had five pennies and I gave you five more, how many would you have___?

If you had five pennies and lost one, how many would you have___?

(Two is passing.)

VERBAL ABILITY

___1. Repeats Five Digits

Say, 4-7. Now say: 3-1-8-5-9_____, 4-8-3-7-2_____, 9-6-1-8-3_____.

Ignore faulty pronunciation.

(One is passing.)

___2. Sentence Building

Listen, I'm going to tell you about cat-mouse. The cat chases the mouse. Now YOU make a sentence about:

a. cow, bigger, pig_____

b. boy, fell, leg_____

c. girl, flowers, field_____

(Two is passing.)

___3. Knows Address

Tell me where you live.

_____

(One is passing.)

___4. Pronounces Sentences Correctly

_____

(Passes Articulation Section Group V.)